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Digital Video/Audio and Serial I/O Optical Extender

User's Manual
for the M5-2A2-TR

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Welcome!

Congratulations on your purchase of the M5-2A2-TR, Digital Video/Audio and Serial I/O optical extender. This manual contains information that will assist you in installing and operating the product.

Product Description

M5-2A2-TR offers integrated extension of digital video, audio and RS-232 interface up to 200m (656feet) for HDMI and up to 2km (6,600feet) for DVI. It maintains HD video signals up to WUXGA (1920x1200) at 60Hz refresh rate for PC and 1080p for HDTV. It is compatible with full DDC2B and HDCP. It supports connecting one of 3 different audio types in the transmitter; RCA, SPDIF (Optic) or SPDIF (Coaxial) and outputting all 3 audio types. RS232 serial interface offers device-to-device and device-to-controller connections to build up control system for A/V integration.

It is designed to multiplex and de-multiplex the DVI/HDMI video, digital/analog audio, Display Data Channel (DDC) command interface, High Definition Copy Protection (HDCP) and serial protocol so as to be linked over 4 LC fibers. It gives benefits of all-glass fiber transmission medium, data security, long distance extension up to 2km, easy plug-and-go installation and no RFI/EMI effects. In addition, a non-trivial feature is that both of Single and Multimode optical fibers are applicable.

Shipping Group of M5-2A2-TR Digital Video/Audio and RS232 optical extender

- ☐ **Tx and Rx boxes:** One Transmitter module & One Receiver module.
- ☐ **AC/DC power adapter:** Two +12V/3A units (including AC cord).
- ☐ **User's Manual**
- ☐ **Option:** Duplex LC Patch Cord (Single or Multi mode glass fiber).

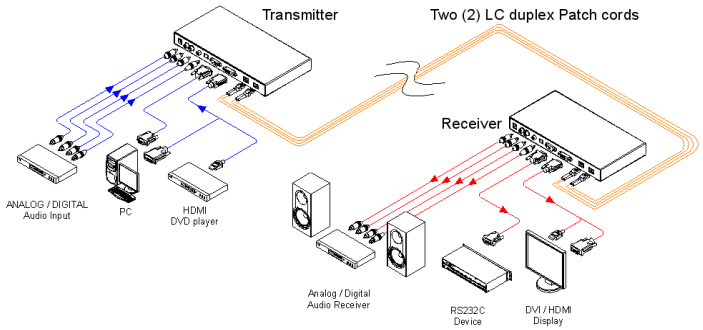

Figure 1 – Overall Digital Video/Audio and Serial I/O Optical Extender

System Requirements for Setup

- ☐ **Hardware requirements**
  - ■ You have a graphic controller card with a DVI port in your Windows/Mac (Mac is option), or SUN system. It should support the maximum graphic resolution feature of the display to be connected.
  - ■ In case of using a computer, no special memory size, CPU speed and chipsets are required.
  - ■ Proper initial trial of the entire platform with its application using a short length copper cable is recommended prior to install with the optical link.

- ☐ **Software requirements**
  - ■ No special needs, if the DVI graphic controller and display peripheral are operational with the platform's OS and application.

- ☐ **AC/DC Power Adapter Technical Advisory**

The power of M5-2A2-TR is designed to supply to each module of Transmitter and Receiver modules by plugging to each of the power plugs.

Installation

Important: Please use the installation procedure below. Improper, or no operation may result if the start-up sequence is not correctly followed.

Step 1
Carefully unpack the contents of the shipping group.

Step 2
With system power turned **off**, connect the Transmitter module to the DVI receptacle of PC or other video source equipment by a DVI copper cable or a HDMI to DVI cable. If necessary, connect the RS232 cable plugs to each D-sub 9-pin connector on PC and Transmitter module.

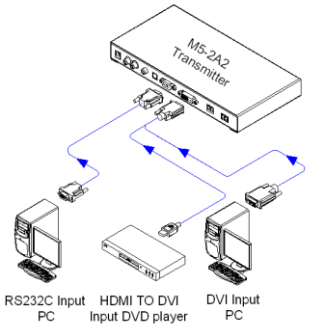

Figure 2 – Connection of DVI and RS232 Cable to Transmitter Module

Select video input with the video source equipment by the switch of front panel.
Notice ; If "DVI" input is selected, HDCP is not supported. Therefore, you have to choose "HDMI", if the video source equipment is compliant with HDCP even though video output may be DVI.

Figure 3 – Selection of Video Input

Selected Input	DDC	HDCP	Maximum Length	Recommended Fiber Type
HDMI	O (direct)	O	200 m	Both SMF and MMF
DVI	O (smart)	X	2 km	Both up to 500m Only SMF up to 2km

Step 3
Connect the Transmitter module to the audio source equipment by audio cables such as RCA, S/PDIF coaxial cable and S/PDIF optical fiber.

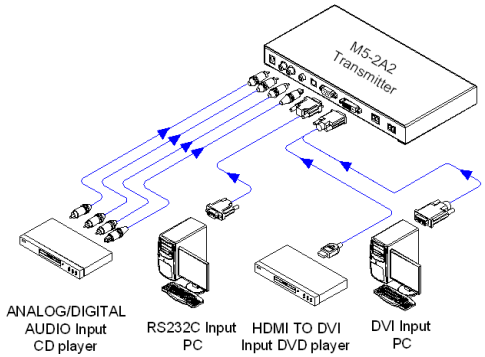

Figure 4 – Connection of Audio Cable to Transmitter Module

You can select one of different 3 audio inputs - RCA, S/PDIF(coaxial) and S/PDIF(optical) - using the button of front panel. Audio input is changed whenever the button is pushed. Ensure LED of the selected audio input lit ON.

Figure 5 – Selection of Audio Input

Step 4
In the same way as above, connect the Receiver module to the display by DVI copper cable and to the audio output equipments such as media receiver or speaker by audio cable. The RS232 devices near the display can be connected by RS232 copper cable also.

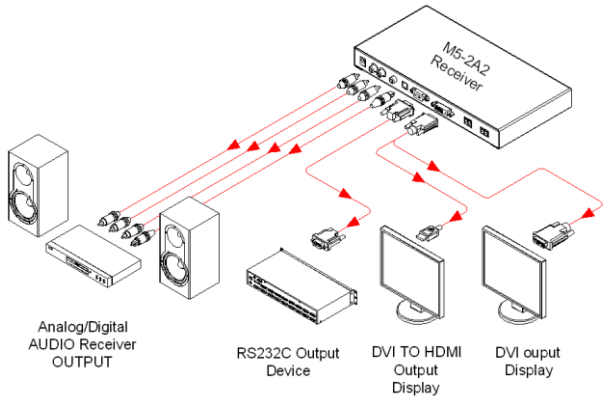

Figure 6 – Connection of Receiver Module

Step 5
Remove dust covers and connect two(2) duplex LC fibers to LC receptacles of the Transmitter and Receiver modules, as shown in Fig. 8. Carefully ensure the duplex LC connector is fully engaged.

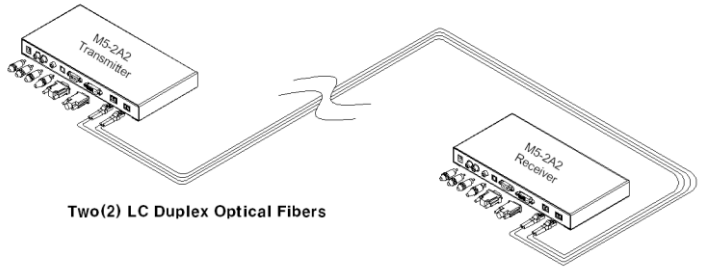

Figure 7 – Connection of Two(2) Duplex LC Optical Fibers

Notice: Please DO NOT look directly into the LC receptacles of Uplink module, while they are powered on, although they are regulated strictly enough to operate under the Laser Class 1, classified by CDRH/FDA for eye safety.

Step 6
Connect an AC/DC power adapter to both Transmitter and Receiver modules as your availability of AC outlets. You can find power indication LED lit on in the both modules.

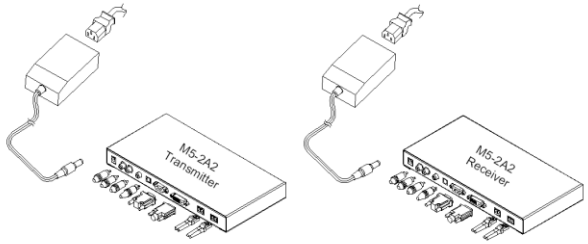

Figure 8 – Connection of AC/DC Power Adapter

Step 7
Power ON the PC and display or connected RS-232 devices. Ensure "STATUS", "OPTIC A" and "OPTIC B" indication LED lit ON, representing secure connection of LC duplex fibers and all kinds of cables.

Tip 1: If any status LED is not ON normally after all installation as guided in the above, we recommend you to push "RESET" button while all connections are set and the Transmitter and Receiver modules are powered in.
Tip 2: Avoid "hot plugging" the Uplink as this is not recommended practice with live digital voltages.

Troubleshooting

The display displays only black screen.

- Check that all AC and DC plugs and jacks used by external power supplies (both Opticis and others) are firmly connected.
- Ensure that power LED lit ON.
- Ensure that the Transmitter and Receiver modules connected correctly to the PC and display, respectively.
- Check if the PC and display are powered on and properly booted.
- Reset the M5-2A2-TR using Reset button on Uplink and Downlink modules.
- Ensure video input is set at "HDMI" if the display and video source equipment are compatible with HDCP.
- Re-boot up the system after reconnecting the LC optical fibers.

Screen is distorted or displays noises.

- Check if the graphic resolution is properly set. Go to the display properties and tap the settings.
- Reset the M5-2A2 using Reset button on Transmitter and Receiver modules.
- Reset the system.
- Power down, disconnect and reconnect the LC optical fiber or DC power adaptors, and power up.

Maintenance

No special maintenance is required for this product. Ensure that this product is stored or used in a benign environment free from liquid or dirt contamination.

There are no user serviceable parts. Refer all service and repair issues to Opticis or its authorized distributor.

Technical Support and Service

For commercial or general product support, contact your reseller. For technical service, contact Opticis by email techsupp@opticis.com or visit its website at www.opticis.com.

Product Specifications

M5-2A2-TR Digital Vide/Audio and Serial I/O Optical Extender

- **Compliance with DVI standard:** supports DVI 1.0 of DDWG, using fiber-optic communication links and DDC2B.
- **Extension limit:**

  200m (656feet) for WUXGA (1,900x1,200) 24bit color at 60Hz refresh rate with direct DDC communication.

  2km (6,560feet) for WUXGA (1,900x1,200) 24bit color at 60Hz refresh rate using smart EDID function.
- **Audio:** RCA, S/PDIF(coaxial), S/PDIF(optic)

  Note) The electrical S/PDIF and Optical S/PDIF port could support D-PCM or PCM audio format only for stereo sound.
- **RS232C:** supports D-sub 9 Pin connectors for RS232C.
- **Fiber-optic Connection:** The transmitter and receiver boxes of M5-2A2-TR have two(2) duplex LC receptacles connected to two(2) duplex Single Mode or Multi Mode optical patch cords.
- **Mechanical specifications of Transmitter and Receiver boxes**
  - **Dimensions:** 260mm / 130mm / 31mm (W/H/D)
  - **Weight:** 460 ± 10.0 gram for each of Transmitter and Receiver.
- **Environmental Specifications**
  - Operating temperature: 0°C to 50°C
  - Storage temperature: - 10°C to 85°C
  - Humidity: 5% to 85%

AC/DC Power Adapter

- **Power Input:** Universal AC 85-264V, 50/60Hz, AC power cord with power jack.
- **Power Output:** +12 V, 3.0 A SMPS DC-power Adapter
- **Cord DC Jack & length:** Core is 12 V and outer cylinder is GND.
- **AC Cord length: 1.8m**
- **Certification: PSE, UL, cUL, FCC, CE, TUV-GS**

Warranty Information

1 (One) Year Warranty

Opticis warrants this Digital Video/Audio and Serial I/O Optical Extender to be free from defects in workmanship and materials, under normal use and service, for a period of one (1) year from the date of purchase from Opticis or its authorized resellers.

If a product does not work as warranted during the applicable warranty period, Opticis shall, at its option and expense, repair the defective product or part, deliver to customer an equivalent product or part to replace the defective item, or refund to customer the purchase price paid for the defective product.

All products that are replaced will become the property of Opticis.

Replacement products may be new or reconditioned.

Any replaced or repaired product or part has a ninety (90) day warranty or the reminder of the initial warranty period, whichever is longer.

Opticis shall not be responsible for any software, firmware, information, or memory data of customer contained in, stored on, or integrated with any products returned to Opticis for repair under warranty or not.

Warranty Limitation and Exclusion

Opticis shall have no further obligation under the foregoing limited warranty if the product has been damaged due to abuse, misuse, neglect, accident, unusual physical or electrical stress, unauthorized modifications, tampering, alterations, or service other than by Opticis or its authorized agents, causes other than from ordinary use or failure to properly use the product in the application for which said product is intended.

Dispose of Old Electrical & Electronic Equipment

(Applicable in the European Union and other European countries with separate systems)

This symbol on the product or on its packaging indicates that this product shall not be treated as household waste. Instead it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product.

The recycling of materials will help to conserve natural resources. For more detailed information about recycling of this product, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

FCC/CE Statement for Regulation of Electro-magnetic Emission

This device complies with part 15 of FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 and 2 of FCC Rules, EN 55022/55024/61000-3 for CE certification. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and. if not installed and used in accordance with the instruction guide, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult a service representative for help.

Properly shielded and grounded cables and connectors must be used in order to comply with FCC/CE emission limits. Changes or modifications not expressly approved by the party responsible for compliance could void the user s authority to operate the equipment.

Certification for Safety

The extension system is certified pursuant to IEC60065 and its AC/DC power adapter is certified by UL1310, 1950, 60950 for North America, cUL or CSA for Canada, TUV-CE & GS for EU and PSE for Japan.

Certification of Eye Safety

This laser product is inside implemented by using 1310nm/1550nm Bi-di Transceivers, manufactured by Opticis Co., Ltd., which are all certified by CDRH/FDA referred in Accession Number 0210774 as classified in Laser Class1.

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